Colorado Department
of Public Health
and Environment

OCT 28 1997

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OCT 28 1997
97-DOE-05524

Dear Stakeholder

Enclosed is the 1997 Rocky Flats Cleanup Agreement (RFCA) and Radioactive Soil Action Levels (RSALs) Annual Review This review is required by paragraph 5 of RFCA to review new and revised statutes and regulations and written policy and guidance to determine if any updates to RFCA are necessary In addition this review fulfills a commitment to review the RSALs

If you have any questions please feel free to call any one of us

Sincerely,

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1997 Regulatory/Radionuclide Soil Action Levels
Rocky Flats Cleanup Agreement
Annual Review
August 1997

I. Background

The Rocky Flats Cleanup Agreement (RFCA or Agreement) was signed by the Department of Energy (DOE), the Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) on July 19, 1996 The RFCA Parties have committed to review the agreement to determine if any revisions are necessary Paragraph 5 of RFCA states

> The Parties shall conduct an annual review of all applicable new and revised statutes and regulations and written policy and guidance to determine if an amendment pursuant to Part 19 (Amendment of Agreement) is necessary

In addition to the annual review prescribed in paragraph 5 of RFCA, the agencies committed to conducting an internal annual review of the radionuclide soil action levels An annual report summarizing the review will be given to the public Questions to be addressed on an annual basis include

1 Is there new scientific information available that would impact the interim action levels?

2 Has a national soil action level been promulgated within the year? If yes, the parties commit to revisit Rocky Flats interim action levels

3 How were the interim action levels applied to the site over the course of the year?

4 Have the remedies been effective?

(See, Responsiveness Summary for Soil Action Levels released on November 6, 1996)

Comments were received from a variety of parties in both oral and written form Responses to specific issues and information are included in Attachment 1, Responsiveness Summary Some comments provided no new information or were not specific enough to address individually

This report is a summary of the Parties' 1997 regulatory/radionuclide soil action levels annual review

A. What the Parties reviewed this year

The 1997 Regulatory/Radionuclide Soil Action Level Annual Review covered the period from July 19, 1996 through July 1, 1997 The following environmental laws, and associated regulations, written policy and guidance, were reviewed

Comprehensive Environmental Response Compensation and Liability Act ,
Resource Conservation and Recovery Act/Colorado Hazardous Waste Act,
Toxic Substances Control Act,
Clean Water Act,
Clean Air Act,
National Environmental Policy Act,
Ecology (e g , Endangered Species Act), and
Radiation

In addition to the above environmental laws and the radionuclide soil action levels, the Action Levels and Standards Framework for Surface Water, Ground Water, and Soils and the Preliminary Programmatic Remediation Goals (PPRGs) were reviewed

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B What the Parties did not review this year

The RFCA Implementation Guidance Document, the Integrated Monitoring Plan, and the Community Relations Plan are commitments within RFCA that will normally be reviewed during the annual review process, however, because these documents were not finalized by July 19, 1997, they were not included as part of this review

C Public Participation

Through a variety of mechanisms, the public was invited to submit any new information relevant to the RFCA or soil action levels for these reviews A public meeting was held on June 2, 1997 and written comments were accepted by the agencies through June 27, 1997 Attachment 1 is a responsiveness summary to comments the Parties received on the 1997 annual review

II. Environmental Statutes

As stated above, all major environmental laws were reviewed Questions which were addressed for each area during the review were

1 Are there any new or revised statutes, regulations, written policy, or guidance?

2 Has the change been implemented at the site? Does it need to be implemented?

3 Does the change impact RFCA and is an amendment required?

Based on the review, no new or revised statutes, regulations, written policy or guidance were identified as final from July 19, 1996 to July 1, 1997 which impacted RFCA or required an amendment On July 21, 1997, the Nuclear Regulatory Commission issued a final rule on Radiological Criteria for License Termination For more information, see the discussion below under Radionuclide Soil Action Levels

The Preble's Meadow Jumping Mouse was proposed for listing on the Threatened and Endangered Species List by the U S Fish and Wildlife Service DOE is required to consider impacts assuming listing until a final determination is made No change to RFCA is required at this time

III. RFCA Attachment 5· Action Levels and Standards Framework for Surface Water, Ground Water and Soils

The Action Levels and Standards Framework for Surface Water, Ground Water, and Soils (ALF) was reviewed to determine if any changes to standards or action levels were necessary Changes to the original ALF were made on October 18, 1996 to reflect the interim radionuclide soil action levels Additionally, the ALF will be updated to reflect the actions taken by the Water Quality Control Commission at its December, 1996 meeting This update will be accomplished by a formal amendment to RFCA

ALF uses Maximum Contaminant Levels (MCLs) from the Safe Drinking Water Act (SDWA) as a basis for ground water action levels The SDWA was reviewed and it was determined that there were no changes in the MCL values which would impact ALF.

ALF applies residential ground water ingestion-based Programmatic Preliminary Remediation Goals (PPRG) as ground water action levels when no MCL is available A review of current toxicity factors was undertaken to determine if EPA had issued any changes which would impact the PPRG calculation The changes are included in Attachment 2

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In addition, RFETS, CDPHE and EPA risk assessors are reviewing the office worker scenario which has been selected to represent future exposure in the Industrial Area The inhalation of accumulated indoor VOC's pathway is being evaluated for its potential effect on office worker PPRGs Any impacts to PPRGs and associated changes to ALF will be incorporated into the 1998 RFCA Annual Review

IV. Radionuclide Soil Action Levels (RSALs)

A. Is there new scientific information available that would impact the interim action levels?

The derivation of the RSALs was based on a number of distinct steps These steps consisted of performing a regulatory analysis, followed by developing a site conceptual model for RFETS and finally, selecting a computer model to derive the RSALs and determining the appropriate input parameters for the model For a discussion on new regulations, see section V 2 below

A Site Conceptual Model (SCM) based on site-specific conditions at RFETS was developed for the derivation of RSALs The SCM was based on the future land uses at RFETS with their associated exposure scenarios, the exposure pathways associated with the exposure scenarios, the soil types associated with the exposure pathways, the radionuclide types found at RFETS and the exposure pathway-specific radiation dose conversion factors The factors used for the SCM have not changed since the RSALs were derived Consequently, the SCM used to derive the RSALs is still appropriate

The RESRAD computer model was used in the original derivation of the RSALs There have been updates to the RESRAD computer model during the past year, however, the parties do not believe that these updates impact the original derivation of the RSALS Consequently, the selection of the RESRAD computer model used to derive the RSALs is still appropriate

RFETS recognizes the need for continuing study of actinide migration and its potential impact on short and long-term surface water quality Actinide specialists continue to investigate the fate and transport of actinides Any new information developed by this continuing investigation will be incorporated into the RSALs where appropriate

B. Has a national soil action level been promulgated within the year? If yes, the parties commit to revisit Rocky Flats interim action levels.

On July 21, 1997, a final rule from the Nuclear Regulatory Commission (NRC), 10 CFR Part 20, Radiological Criteria for License Termination, was published in the Federal Register Although intended for License Termination at NRC licensed facilities, and therefore not currently binding on DOE facilities, the rule may be appropriate for use in guiding cleanup at Rocky Flats This rule was not reviewed as part of the annual review since it was finalized after the close of the annual review period However, the issuance of the rule is assumed by the RFCA parties to be related to soil action levels and decommissioning levels and is being evaluated Stakeholders are being asked to participate in the review of the NRC Rule Interested parties can contact a RFCA Project Coordinator

A Nuclear Regulatory Commission guide not considered during the RSAL development was also reviewed The Working Draft Regulatory Guide on Release Criteria for Decommissioning NRC Staff Draft for Comment, NUREG 1500, August 1994 was reviewed within the D&D Work Group and discussed with NRC staff NRC is withdrawing this draft guidance and replacing it this winter with NUREG 1549, based on the new NRC Rule discussed above The new information will be considered in next year's annual review

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C. How were the interim action levels applied to the site over the course of the year?

T3/T4
The source removal at T3/T4 was prompted by the presence of Volatile Organic Compounds (VOCs) in levels exceeding Tier I values and contributing to ground water contamination Following treatment for VOC's, soils were evaluated against the RSALs Soil below the Tier II level was returned to the excavation, soils between the Tier II and I levels were placed within a geotextile barrier in the excavation, and soils in excess of Tier I were packaged for off-site disposal as low level waste Approximately 3,800 cubic yards were treated 40 cubic yards of soil and debris and 36 cubic yards of radiologically contaminated soil, not necessarily exceeding Tier I action levels, were packaged for off-site disposal This soil was generated during site reclamation activities following debris sizing Two hundred and fifty cubic yards were placed in geotextile in order to isolate the material should it require re-excavation in the future The location of the geotextile was surveyed and documented The remainder of soil was placed back in the trenches

Mound
The source removal at the Mound Site was prompted by the presence of VOCs in levels exceeding Tier I values and contributing to ground water contamination Mound soil was screened as it was excavated and is all well below the Tier II RSALs and will be returned to the excavation without the need for segregation

IHSS 119.1
The final Operable Unit 1 Corrective Action Decision (CAD)/Record of Decision (ROD) specified a source removal through excavation at IHSS 119 1 Through preliminary investigation with a geoprobe, soil samples indicated that rad values were well below the Tier II levels It also indicated that the VOCs were not localized and that excavation is not warranted The CAD/ROD will be revised accordingly

D. Have the remedies been effective?

The remedial actions taken during the year were driven by the soil action levels for VOCs No IHSS remediations occurred during the year that were driven by the RSALs Since the removals at Ryan's Pit, T3/T4, and Mound, monitoring of ground water has continued Due to the low hydraulic conductivities of the Rocky Flats alluvium, it is too early to know (from monitoring results in down-gradient wells) the effectiveness of the remedies for VOC contamination It is clear, however, that the removal of substantial quantities of volatile organic compounds has permanently removed several potential sources of contamination

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Attachment 1

Responsiveness Summary for Comments to the 1997 Regulatory/Radionuclide Soil Action Level Annual Review

Comments:

The removal of the foundations of building which obstruct the natural flow of underground streams at the site will have an effect on the present ground water flow A request was made to construct a conceptual model to determine the impact of foundation removal on ground water flows and that the model become part of the RFCA

Response

The purpose of RFCA was to establish the regulatory framework for achieving the ultimate cleanup of the site As part of the framework, a process was established for developing, implementing, and monitoring appropriate response actions at the site and to ensure that such actions are conducted in accordance with CERCLA, RCRA, CHWA, and other applicable State and Federal environmental laws Models developed to assist in understanding the hydrology and contaminant movement and impacts will be developed as part of the cleanup process The first step is to understand the ground water flows throughout the site and most importantly in those areas where contaminants exist Secondly, it is essential to understand the movement of organic, inorganic, and radionuclides in the hydrologic system These analytical efforts may be IHSS-specific or area-wide for the Industrial Area Foundation and buried utility impacts on groundwater flow will be included as appropriate

Comment:

The City of Westminster requested that its concerns for contaminated ground water impact on Standley Lake and Woman Creek Reservoir be archived for incorporation into the final Record of Decision for the RFETS

Response

The City of Westminster's concerns are documented as part of this report, consequently, since this report will be included in the administrative record for the site, the concerns will be reviewed as part of the final Record of Decision process In addition, the City of Westminster will have further opportunities to raise its concerns during public comment periods of future actions, annual reviews and the final Record of Decision

Comment:

Members of the public expressed continued concern over the interim soil action levels for radionuclides set for the cleanup of the site Requests were made in support of having the interim soil action levels for radionuclides and computer modeling used to generate action levels reviewed by nationally known experts

Response

A meeting between stakeholders and DOE Headquarters staff responsible for considering this request occurred on September 15, 1997 Interested parties should contact a RFCA Project Coordinator for more information

Comment.

A recommendation was made that the Parties find new ways to incorporate impacted communities more effectively in the consultative process One suggestion was to expand the scope of participation in formal discussions, scoping activities, training, and overall implementation

Response

The Parties are continually seeking new ways to better communicate and to have more effective consultative process However, there are times when meetings between the Parties without members of the public present are appropriate In the future, the Parties will let impacted communities know the outcome of such meetings and when and how the impacted communities may become involved in any discussions in which they are currently not involved Please note that participation may involve attendance at daytime meetings and some work in getting into technical detail

Comment:

A recommendation was made to utilize the Rocky Flats WEB page as an additional central source for obtaining many of the cleanup decision-making documents, including those commissioned by the contractors to support the 2006 Plan

Response

The Site is continually looking for ways to better communicate, including means to share information regarding cleanup decision-making documents that are available and how copies may be obtained if including them on the WEB page is not possible DOE is evaluating strategies for incorporating additional information onto the Site WEB page The DOE WEB site is HTTP\\ RFETS GOV\ Comments on the WEB page are welcome

Comment:

Innovative technologies are not specifically referenced in the RFCA How will a technology development program help to improve RFCA implementation?

Response

Currently, technologies exist to perform all the necessary environmental cleanup at RFETS New technologies may be developed that will make cleanup safer or less costly RFETS staff (and stakeholders) are constantly monitoring technology developments nationwide for applicability at RFETS When deemed promising, tests of new technologies are performed The reactive barrier demonstration at the Mound Plume Seep 59 in early 1998 is an example

Comment:

At Enewetak, where the U S conducted nuclear weapons tests, the AEC/ERDA decided that plutonium concentrations exceeding 40 pCi/gm of soil were too unsafe to allow people to move back into the area Why aren't we using the same values at Rocky Flats?

Response

Enewetak cleanup criteria were developed during the 1970's using the using the best methods available for calculating risk from radiation exposure Those methods have been refined extensively over the past 20 years in response to new scientific data and numerous reviews by national and international agencies and organizations

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In developing the RSALs for Rocky Flats, a decision was made to use the most current guidance available, which at the time was the proposed EPA rule citing 15 millirems per year The current guidance for Superfund site risk assessment was used, along with other guidance and site-specific data to convert this dose to a soil concentration

We believe that if cleanup criteria for Enewetak were being developed today, the responsible agency would use a method very similar to that employed to calculate the radionuclide soil action levels at Rocky Flats It is important to remember that even if the Enewetak levels were calculated using modern methodology, the levels may not be an exact match to those at Rocky Flats due to potentially contrasting land use assumptions, and the significant physical differences between a Pacific atoll and the high-plains prairie where Rocky Flats is situated

[Reference The Radiological Cleanup of Enewetak Atoll, Defense Nuclear Agency, 1981]

Comment:

Why is a breathing rate of 13 9 liters per minute (l/min) used for calculating RSALs, whereas sedentary healthy young men breathe up to 40 l/m?

Response

The RESRAD model used to convert dose to soil concentrations used a breathing rate of 20 cubic meters per day, which is the value used nationally for Superfund sites This value represents an average of the population over a twenty-four hour period and includes proportionate levels of activity ranging from strenuous to sedentary

The 13 9 l/m value corresponds approximately to the 20 cubic meters per day used in RESRAD The 40 l/m value represents strenuous activity (for example, running at 4 5 miles per hour) in adult males, as noted in Table 5A-3 in the EPA 1996 Exposure Factors Handbook

Comment:

How can national data for breathing rates be used at RFETS' high altitude?

Response

The national value for breathing rate is applicable for higher altitudes When a person moves into a higher altitude, there is a temporary increase in breathing rate to ensure that the body receives an adequate supply of oxygen Subsequently, the body adapts to the lower oxygen environment by undergoing specific physiological changes As a result, the breathing rate returns to normal, generally within three to six months Since the risk estimates are concerned primarily with long term, chronic exposure, this temporary increase in breathing rate would not significantly impact the exposure or the risk calculations

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